Idaho Panhandle

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
Region 1, Missoula, Montana 59801

REPLY TO: 5200 Forest Insect and Disease Control

MAR 18 1974

SUBJECT: Emergency Exemption for Use of DDT to Control Douglas-fir Tussock Moth

TO: Cooperators, Douglas-fir Tussock Moth Action Program

Here is a copy of Russell Train's order on the Forest Service request for an emergency exemption for use of DDT to control Douglas-fir tussock moth, for your information.

Restrictions imposed by the Environmental Protection Agency on use of DDT have been reviewed by the Interagency Douglas-fir Tussock Moth Working Group. Their conclusions are that these restrictions are not significantly different from those we imposed upon ourselves in the Environmental Impact Statement and we can conduct an effective program within this framework.

If any questions arise regarding this order, please contact the Division of State and Private Forestry.

Lawrence M. Whitfield

STEVE YURICH
Regional Forester

Enclosure

Distribution:

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cc: WO (R. K. Smith)
Project Manager, SEAM

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ENVIRONMENTAL PROTECTION AGENCY

ORDER ON

U.S. FOREST SERVICE REQUEST FOR AN EMERGENCY EXEMPTION

FOR USE OF DDT TO CONTROL THE DOUGLAS-FIR TUSSOCK MOTH

On June 14, 1972, the Administrator of the Environmental Protection Agency (EPA) issued an Order cancelling most uses of DDT. This Order was issued under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) (7 U.S.C. 135 et seq.) following seven months of hearings. The use of DDT for control of the tussock moth was not specifically addressed in that Order, but there is no present registration of DDT for this purpose. Use of DDT for control of the tussock moth is therefore presently prohibited.

On January 3, 1974, the U.S. Forest Service requested an exemption from this prohibition for the contingency use of DDT to control a potential emergency outbreak of the Douglas-fir tussock moth on Federal, State, and private lands in Oregon, Idaho, and Washington. The States of Washington and Oregon have made separate similar requests. These requests are made pursuant to Section 18 of FIFRA as amended by PL 92-516 (86 Stat. 973) which provides that the Administrator of EPA "may, at his discretion, exempt any Federal or State agency from any provision of this Act if he determines that emergency conditions exist which require such exemption."

This Order sets forth the Agency's disposition of these requests.

I. Background

A. The 1974 Request

The U. S. Forest Service requests an exemption from the registration requirements of FIFRA on a contingency basis. If the exemption is granted, the Forest Service will determine in May and early June whether DDT use is necessary to control the tussock moth, given conditions at that time. The Forest Service presently estimates that perhaps as many as 650,000 acres will require spraying in order to prevent serious tree damage. At a rate of 0.75 pounds per acre, approximately 490,000 pounds of DDT might therefore be required. This compares with the more than 150 million pounds of DDT which were used worldwide, and the 20 million pounds used in the United States at the time of the 1972 Order.

The Forest Service made its request for the use of DDT conditional upon a finding that emergency conditions exist after the 1974 egg hatch, and that "natural controls will not reduce the larval populations to tolerable levels." 1/ The Forest Service requested that EPA decide on this contingency request before March 1, 1974, to allow sufficient planning and contractual lead time. Application of DDT, if authorized, would occur in late May or early June when the moth larvae emerge from the egg masses.

1/ January 3, 1974, letter to Russell E. Train from Paul A. Vander Myde, Deputy Assistant Secretary, Conservation, Research and Education, USDA.

B. The 1973 Request

In the spring of 1973, EPA received similar requests for emergency exemptions for the use of DDT to control the tussock moth from the U.S. Forest Service, several towns in the Blue Mountains area of Oregon and Washington, and from the Boise-Cascade Corporation. An Environmental Impact Statement was filed by the Forest Service covering last year's proposed DDT Spray Program.

EPA denied all of the 1973 requests for the emergency use of DDT. Many forest and entomology experts predicted that the tussock moth population would collapse as a result of the presence of a nuclear polyhedrosis virus, a natural enemy of the moth. EPA recognized that some tree damage would result before the collapse could occur, but this damage was not expected to be large enough to outweigh the risks of DDT use. While the virus may have caused collapse in certain areas of the infestation, the 1973 damage exceeded expectations, and significant new infestations developed in the summer of that year.

C. EPA's Processing of the 1974 Request

In addition to the contingency request of January 3, 1974, the U.S. Forest Service, in cooperation with the U.S. Department of the Interior, prepared a Draft Environmental Impact Statement (DEIS) which was submitted to the Council on Environmental Quality on December 28, 1973. The Forest Service has requested comments on this Draft Statement, and has stated that it intends to file the final Environmental Impact Statement sometime in March, 1974.

The DEIS covers only the actual application of the chemical by the Forest Service, and in no way is binding upon the EPA decision. The EPA decision need not, and cannot, because of the lead time required to prepare for the 1974 control program, await the filing of the final EIS. The DEIS was prepared pursuant to the requirements of the National Environmental Policy Act (83 Stat. 852), while the Environmental Protection Agency decision is governed by the provisions of the FIFRA. The Draft Environmental Impact Statement has provided EPA with considerable information to support the Forest Service request, but the Agency was not limited to this or any other source of information in making its decision.

In fact, the Agency has conducted extensive investigations of the entire issue ranging far beyong the DEIS. Agency officials have attended meetings of the Interagency Tussock Moth Steering Committee, an intergovernmental group which has made efforts to determine the need for and the methods of tussock moth control. EPA sponsored a Technical Information Seminar to examine the means for control of the tussock moth on November 16, 1973 in Seattle, Washington. EPA held four public hearings on the issues raised by the Forest Service's request for the use of DDT and by the Draft Environmental Impact Statement between January 14 and January 30, 1974, in the Pacific Northwest, and a final hearing in Washington, D. C. on February 1, 1974. Members of the public were invited to testify or submit written statements, and the record of these hearings was held open until February 4 to receive public comments. Numerous public officials testified at these hearings and many others submitted statements.

After initial review of the DEIS, EPA felt that additional information was needed from the Forest Service. Accordingly, by letter of January 21, 1974, the Agency requested response from the USDA-Forest Service to numerous detailed questions. A reply was received from the Head of the Forest Service dated February 5, 1974, which provided some additional information. In further response to the EPA letter and subsequent meetings with the Forest Service, USDA has made available to EPA copies of preliminary work plans, monitoring plans, and draft research designs for continuing Forest Service work on tussock moth control.

Additionally, EPA officials met with Forest Service research and field personnel in the Pacific Northwest during the month of January. At these meetings, EPA reviewed and discussed the methodology and criteria used by the Forest Service to survey egg, larvae, parasite and virus populations, and the status of development of alternatives to DDT.

D. The Douglas-fir Tussock Moth - Description and Biology

The Douglas-fir tussock moth (Orgyia pseudotsugata McDonnough) is a native insect of the Northwest and a natural component of the forests in that area. Under usual circumstances it exists in endemic numbers, but periodically increases to epidemic proportions and defoliates large acreages of its host trees. The Douglas-fir tussock moth produces one generation per year. Egg masses are laid on tree branches and trunks in

the fall, and remain there through the winter; the larvae emerge from the egg masses in late May or early June after the host trees have begun new growth. The larvae feed on new foliage first, and, as they grow larger, begin feeding on the older foliage. It is during their five to seven larval states, particularly from the second instar on, that severe defoliation may occur. When mature, usually from late July to the end of August, the larvae pupate and emerge in 10 to 18 days as adult moths. Mating takes place on the cocoon where the female deposits a mass of eggs, averaging about 200 eggs per mass. Adult moths do not feed, and die within a few weeks. Because the female moth cannot fly, the population can spread only by wind dispersal of the larvae.

The tussock moth is most susceptible to control during the early larval stages (late May or early June). The tussock moth has many natural enemies, including disease organisms, insect parasites, predators, and birds. A nuclear polyhedrosis virus appears to be the major natural mortality factor in the dramatic population collapses that have terminated many previous outbreaks. This virus usually becomes significantly active in the third year of the population outbreak.

The exact relationship between the presence of tussock moth larvae and tree damage is not clear. We are certain that as the larvae population decreases toward zero, the amount of defoliation and tree mortality decreases. Exactly where the threshold points are, however, has not been clearly established. Even if these threshold points were known for certain, the task of determining exactly what the population of larvae is at any one time on a tree or on a group of trees is

subject to serious measurement difficulties. Also relevant in forecasting the amount of damage which may occur from a particular population of larvae are: the extent of the virus population and other natural enemies of the larvae; whether the population of larvae is increasing or decreasing; and whether or not the trees have suffered previous damage. In short, although we know a considerable amount about the biology of the tussock moth, and its relationship to the forest on which it preys, there are still many areas where further knowledge is needed.

E. Previous Outbreaks

The first recorded tussock moth outbreak occurred in 1918 near Chase, British Columbia. Since then, major epidemics have occurred every decade in the fir forests of Western North America. Outbreak periods of the tussock moth seem to compress into three year cycles, but have been known to continue into a fourth and fifth year, and in one instance, up to 10 years. The outbreaks appear to develop explosively, in place, rather than as a result of a spread from one geographical area to another. Detection of tussock moth populations at endemic, or low levels, is difficult. Visible defoliation is not usually detectable or adequately assessed until the second year of the outbreak making early detection of epidemic populations difficult.

F. The Current Outbreak

Although often referred to as one, there are presently several distinct outbreaks in the Northwest: one in the Blue Mountains of Eastern Washington and Oregon, one in the Colville Indian Reservation, and two in Idaho

In the years 1972 and 1973, the tussock moth defoliated trees on 800,000 acres. Of these, 17,000 acres of forest were completely killed; on an additional 71,000 acres, at least 50% of the Douglas fir were killed. In 1974 the Forest Service predicts that 650,000 acres will suffer serious damage if treatment with DDT is not approved. Some of this damage will occur on acreage which has not previously suffered defoliation. This projection is based on the finding of a number of new egg masses in the infested areas. While the number of egg masses is not determinative with regard to the intensity, extent, and possible danger of the infestion, it does indicate a potential for serious damage to the forest resources and environment in 1974.

The age of infestations in the various areas differs, and therefore the moth populations are at different stages of the infestation cycle. The infestation in the Blue Mountains is older and further advanced than those in the Colville area or Idaho. There are probably subinfestations within the larger infestations which may be at different levels of development. It is possible that the nuclear polyhedrosis virus occurred significantly in those populations which were three years old in 1973, but that it did not affect the newer infestations. The varying ages of the moth populations contributes to the difficulty of assessing the impact of the virus.

Approximately two-thirds of the infested area is Federal land; the remainder is owned either by the respective States or private landowners. Indian land comprises 17 percent of the infested area.

G. Possible Control Methods

1. General Requirements. In discussing the effectiveness of any control agent for the tussock moth, the following factors should be kept in mind: (1) tests which show conclusively that a substance will kill tussock moth larvae are not necessarily conclusive on the point that the substance will prevent or control tree damage; (2) the effectiveness of control measures depends, in part, upon the intensity of the infestation, particularly the number of larvae per thousand square inches of foliage. This second factor is illustrated by the following example: If the number of larvae per thousand square inches which will cause tree damage or mortality is determined to be 20, then the effectiveness of the control must be measured by its ability to reduce the larvae population below that number. If the level of infestation is 400 larvae per 1000 square inches, a control which is 96% effective will reduce the population to 16 larvae per unit. However, if the infestation level is 800 larvae per 1000 square inches, then 96% effectiveness will yield a reduction to only 32 per 1000 square inches--a level which could be expected to produce tree damage. Consequently, even a control agent with a relatively high capability to kill larvae (96%) may not be effective in preventing losses in a heavy infestation, but would be in a light infestation

2. Chemical Controls. A number of chemical alternatives to DDT have been tested in the past. Tests on the current infestation, carried out in 1973, showed the following results:

(a) Zectran: tested on 70,000 acres in 1973, Zectran achieved larval mortality up to 93%, but did not provide satisfactory tree protection under the conditions used and the larvae present;

(b) Carbaryl (Sevin): in smaller tests, a carbaryl formulation achieved larval mortality up to 90%. In one case, where the intensity of infestation was lower, some tree protection was afforded;

(c) Trichlorfon (Dylox): 1973 tests showed larval mortality up to 98%, and some foliage protection; however, new growth was seriously defoliated;

(d) Bioethanomethrin and resmethrin: these synthetic pyrethrins are highly toxic to tussock moth larvae and showed promising results in 1973 tests; however, the adaptation of the most effective application technology to forest uses has not yet been made;

(e) DDT: DDT was registered against the tussock moth in 1947. The Forest Service discontinued its use in forests in 1968. Laboratory tests show DDT to be toxic to tussock moth larvae. Field experiments have shown larval mortality to range up to 100% when compared to unsprayed check plots in the same infestation. Since DDT was not tested in the field during the 1973 infestation along with the other chemical controls, there is no statistical evidence correlating the use of DDT with

prevention of tree mortality. However, there is qualitative evidence from competent authorities based on past use that DDT will control the tussock moth and afford tree protection.

3. Biological controls. Biological controls have been tested against the tussock moth in recent years. 1973 tests on two of these showed the following results:

(a) Bacillus thuringiensis (BT): already registered against a number of forest pests, BT was tested on 20 acre plots in 1973, and showed larval kill ranging from 80 to 98% in a new formulation;

(b) Polyhedrosis virus: this is the natural virus which normally causes collapse of tussock moth infestations. Applied artificially in 1973, the virus achieved larval kill up to 97%.

The safety of artificially cultivating and distributing the virus on a wide-scale basis is still under considerable debate.

H. Uncertainties

From the foregoing discussion, it should be clear that the Agency presently lacks considerable data which, ideally, should be assessed before a decision is made. Unfortunately, this is very often the case in decisions concerning the protection of the environment given the complexities of the ecological system and uncertainties surrounding the environmental impacts of change introduced by man.

In the present case uncertainties occur in the following areas:

(1) The relationship between the intensity of larval populations and damage to trees;

(2) The efficacy of controls to prevent damage;

(3) The exact economic and social impact of a decision not to control the infestation;

(4) The extent of the virus population this year and its relationship to the potential collapse of some or all the infestations.

II. The Decision

Although under optimum conditions this Agency would postpone the decision on the Forest Service's contingency request until more of the uncertainties could be resolved, this option is not realistically open. A decision must be made at this time in order that planning and contractual arrangements for the 1974 control program may be made. If the EPA decision is positive, the Forest Service must know early in order to obtain supplies of DDT in the proper formulations, to contract for the application of the material, and to initiate the necessary research and monitoring planning, and design the operational procedures and the performance training which would ensure that the most environmentally sound application procedures are used. On the other hand, if the EPA decision is negative, the Forest Service and the involved State agencies must now begin to evaluate the practicality of fall-back actions which might be desirable.

If a dramatic decrease in the level of these uncertainties were possible or likely during the next one to two months, the Agency would be more disposed toward delaying this decision despite the severe difficulties this could cause in the structuring of the 1974 control program.

This is not, however, the case, and EPA is reluctantly persuaded that a decision must be made now as to whether the present situation qualifies for an exemption under Section 18 of the FIFRA.

A. Legal Parameters of the Decision

Section 18, in its entirety, reads as follows:

"The Administrator may, at his discretion, exempt any Federal or State agency from any provision of this Act if he determines that emergency conditions exist which require such exemption."

On December 3, 1973, EPA published final regulations for this Section setting forth general requirements and the procedures to be followed (38 F.R. 33303). Section 166.1 of these regulations sets forth the parameters of decisions under this Section of the Act:

> "An emergency will be deemed to exist when: (A) A pest outbreak has or is about to occur and no pesticide registered for the particular use, or alternative method of control, is available to eradicate or control the pest, (b) significant economic or health problems will occur without the use of the pesticide, and (c) the time available from discovery or prediction of the pest outbreak is insufficient for a pesticide to be registered for the particular use. In determining whether an emergency condition exists, the Administrator will also give consideration to such additional facts requiring the use of Section 18 as are presented by the applicant."

In applying these criteria to the Forest Service request, the Agency has determined that emergency conditions do exist which require such an exemption from the requirements of FIFRA. This exemption is not a directive from this Agency that DDT should be used this summer against tussock moth. It is the hope of the EPA that an actual emergency will not arise in the Northwest at the time of egg hatch and that spraying of DDT will not be necessary. This Agency's decision to grant this contingency request is based on the following findings:

1. A pest outbreak has or is about to occur and no pesticide registered for the particular use, or alternative method of control, is available to eradicate or control the pest.

(a) Occurrence of an Outbreak. The law does not require EPA to find that an actual emergency exists at the time of the decision. Instead the Agency must find that "emergency conditions" exist. This is an important distinction which embodies Congress' recognition that there are times when EPA's decision cannot await the actual start of an emergency since this would delay, and thereby effectively deny, the requested relief. This distinction is reflected in the regulations by the specification that EPA may find that "a pest outbreak has or is about to occur" (emphasis added). In the case of the pending Forest Service request, it is clear that the tussock moth activity is not, today, causing an emergency. The moths are in the egg stage, and no defoliation is now occurring. It is known, however, that when the eggs hatch, the larvae possess the potential for severe defoliation or tree mortality, and that the extent of that potential can only be determined very near the time when control measures would have to be taken in order to avoid tree damage.

(b) Effective Means of Control. The regulations also require EPA to examine alternative means of control. Clearly, if a registered pesticide, or other means of control which the Agency is prepared to recommend as a substitute, could afford practical, effective control, the need for an exemption under Section 18 would be obviated. A number of controls which are not registered have, however, been considered by the Forest Service and EPA. These are the various chemical and biological controls discussed earlier in this Order. Although the Agency would wish to have better data on the efficacy of all of these controls, available evidence indicates that DDT will give better assurance of effectively controlling tussock moth damage than any of the alternatives available at this time.

2. Significant economic or health problems will occur without the use of the pesticide.

The Forest Service is projecting losses of $67 million this year if the emergency develops and no control is instituted. Although these projections can vary substantially depending on alternative accounting procedures which could be used, they are significantly higher than the April 1973 projection of $12.9 million which formed part of the basis for the Agency's decision last year that the risks outweighed

the benefits of DDT use against the tussock moth. The fact that the Forest Service now estimates that the 1973 actual losses were $77 million illustrates a crucial point. The biology of the tussock moth, our ability to predict the extent of the infestation and the resulting damage, and the volatility of the supply and demand of timber make economic impact projections uncertain until the infestation takes its toll.

The decision last year was based to a large extent on the expectation that the natural virus would bring about the collapse of the moth population and thereby reduce the damage and the threat of future losses. Although the surveys this Spring will provide more definitive data on the extent of the virus population, it is already clear that last year the impact of the virus was less than was necessary to bring the infestation under control. In addition, new egg masses have been found since last year.

The projected economic impact, though perhaps small when seen from a national point of view, can be catastrophic on a regional or local level. Even if the actual economic impact were to prove to be considerably smaller than the total now projected by the Forest Service, the local impact would most probably be severe. Of particular concern are the Indian lands which comprise 17% of the infested area.

Forty to 50% of Indian employment is directly in the forestry industry, and this industry generates about 95% of tribal income.

Any consideration of the economic and health impact of this infestation must consider the potential fire hazards resulting from defoliation. Forest fires are related to soil temperatures, water content, and fuel, all of which may be affected by severe defoliation.

While there is no way of estimating the probability of a major forest fire in the watershed area, the Forest Service estimates that, in areas of total defoliation, available fuel is four times greater than normal. This will change the nature of any fire outbreak, and will increase the speed at which a fire can spread from about four acres per hour to 25 acres or more per hour.

In light of the above factors, EPA concludes that the economic and health impact which will occur without the use of the pesticide will be significant.

3. The time available from discovery or prediction of the pest outbreak is insufficient for a pesticide to be registered for the particular use.

DDT was registered for use against the tussock moth at a time when its potential effects on man and wildlife were not known. FIFRA as amended in 1972 requires the Agency to

find as a condition of registration under Section 3 that the pesticide will perform its intended function without unreasonable adverse effects on the environment. Because exemptions under Section 18 are given only when emergency conditions exist, are limited to time, and can be made very specific with regard to time, place, and manner of application, the information requirements for a Section 18 exemption can be less than registration requirements under Section 3 of the Act.

Registration of a pesticide under Section 3 for use against the tussock moth would require extensive and replicated data on the efficacy and the environmental effects of such use. The biology of the tussock moth and the conditions necessary for determining the effectiveness of a pesticide in preventing tree damage (as contrasted with killing larvae), make it very difficult to conduct meaningful research on the efficacy of a particular pesticide except during a large infestation. As a result, last year was the first time since the 1972 Order that field research on the efficacy of alternative control methods could have been initiated. The amount of research done at that time fell far short of what, in hindsight at least, was clearly required. Nevertheless, it is unlikely that any research program, no matter how

extensive, would have produced in the space of one year evidence adequate to register a pesticide for use against the tussock moth, given the inconclusive results for the various alternative controls in the research program last year. The Agency finds therefore, that there has not been sufficient time for the Forest Service or others to obtain registration for a pesticide for use against the tussock moth since the 1972 Order of this Agency.

4. Risks and Benefits

In determining whether emergency conditions exist which require an exemption under Section 18, extensive balancing of risks and benefits, and determination of no "unreasonable adverse effects on the environment," are not required as they are in other Sections of the Act. Nevertheless, a consideration of the risks and benefits is desirable when, as in this case, a significant quantity of a cancelled pesticide is proposed for use.

In order to find guidance for consideration of the risks and benefits of DDT, this Agency has turned to the June 14, 1972, EPA Order which cancelled most uses of DDT after a seven month hearing. This decision has been upheld by the U.S. Court of Appeals for the District of Columbia. Even though this decision was made under a

different Section of FIFRA, one which required extensive risk/benefit balancing, this Order provides a lens through which the Forest Service request may be viewed.

The 1972 Order found substantial risks associated with DDT. Specifically, the Order found that DDT has acute and subacute effects on aquatic and avian species and that it can have adverse reproductive impacts on certain birds. Laboratory tests indicate that DDT produces tumors in test animals and is a potential carcinogen to man. The persistence of the chemical in the environment increased the Agency's concern about these effects.

The Order concluded that the use of DDT on cotton and most other crops should be cancelled so as to stop the major contribution of DDT to the global ecology by the United States. The Order recognized, however, that there would have to be exceptions to this general policy. These exceptions are for those situations where the benefits outweigh the risks because of such factors as:

(a) the unavailability of practical alternative means of control;

(b) the temporary nature of the use because of the need for a transition period to an alternative control method or to an alternative crop;

(c) the possibility of minimizing the impact on the environment because of restrictions which could be imposed on the specific use.

These guidelines are helpful in analyzing the Forest Service's request:

(a) EPA finds no reason to depart from the findings of the 1972 Order with regard to the potential risks of DDT.

(b) As discussed above, there is no clear alternative means of control for the tussock moth.

(c) The proposed use is temporary. The Forest Service has asked for an exemption to use DDT only for the 1974 control season. It is EPA's expectation that alternative means of control will be available for post-1974 outbreaks. While substantial quantities of DDT would be introduced into the environment, the proposed Forest Service use would be only short-term.

(d) The risks to the environment in this instance can be minimized by placing controls on the way the program is conducted. In addition, prespray surveys and assessment of the viability of the egg populations after the winter can aid in holding to a minimum necessary the acreage where control is needed. It is possible that the egg masses will overwinter poorly, or that the virus will increase such that the need for chemical control is reduced. Careful assessment of these indicators can be made to insure that no unnecessary application of DDT would be made.

III. Conclusions

For all of the foregoing reasons, this Agency concludes that the 1974 tussock moth situation in the Northwest meets the requirements of Section 18 of FIFRA and that the Forest Service should be granted its contingency request for an exemption from the provisions of FIFRA which prohibit the use of cancelled pesticides, specifically, the use of DDT. As noted above, it is the Agency's hope that an actual emergency requiring the use of DDT this summer will not occur. Against the very real possibility, however, that the conditions needed to prevent an emergency will not develop, the EPA has granted the Forest Service an exemption from the prohibitions of the FIFRA so that contingency preparations for the use of DDT can be made. In the interest of achieving a uniform program embodying consistent criteria for the identification of areas to be sprayed and standard operational controls which minimize the environmental impact of DDT use, the requests of the States of Washington and Oregon are denied. It is this Agency's understanding and expectation that the Forest Service will meet the control needs in these States. The Forest Service's exemption is granted subject to the following restrictions and requirements:

A. Spray Restrictions:

1. The laboratory hatch of egg masses shall be carried out, and all acreage eliminated where larval incidence is too low to justify DDT use or where viral incidence will control the outbreak

without such use. The validity of the laboratory data shall be verified by field surveys carried out at the time of natural egg hatch. The Forest Service should make every effort to refine both laboratory and field criteria for the above factors so that no acreage is sprayed unnecessarily;

2. An unsprayed buffer strip of at least 200 feet shall be left along live streams and waterways. Helicopter applicators shall take meteorological conditions into account and adjust spray courses and timing to ensure that DDT does not drift into these buffer strips.

3. Live streams and waterways shall be clearly marked on maps and photo aids for pilots. In addition, these water areas shall be marked with flags, balloons, and kytoons to avoid accidental spraying of water;

4. Payment of applicators shall be related to amount of spray actually reaching the target areas.

5. No spraying is to take place where winds exceed 6 m.p.h., or where temperature inversions exist. Meteorological conditions shall be verified by competent meteorologists on the the ground at the spray site;

6. To the extent possible, livestock and other domestic animals shall be removed from the treatment area; hunters shall be informed as to the possibility of DDT residues in game animals taken from the spray area;

7. Warnings shall be prominently placed in public places within all areas to be sprayed, giving the date, time and duration of the spray project;

8. Applicators shall be licensed by their respective States, and shall be trained both on general procedures and in the field at the site of the spray project. Demonstrable familiarity with the geographical features of the spray area, especially waterways, is essential;

9. Deposition of spray at the target shall be monitored during the actual spray, using appropriately sensitized cards;

10. Spray boundaries shall be indicated by the use of flags, balloons and kytoons;

11. Complete records of the spray project shall be kept, including locations, quantity, times and places, and shall be furnished to EPA and the public within ten days of completion of the project.

B. Research Requirements:

The development of reliable, registerable alternatives to DDT for forest pest management must become a first priority for the Forest Service. Consequently, before the commencement of any spray program, the Forest Service shall take whatever steps are necessary to assure that research will be carried out which, if successful, will be sufficient to support a registration request for the possible alternatives to DDT. This research must be completed in time to submit the necessary documents to

EPA no later than December 1, 1974. This research must not be limited to the determination of whether alternative chemicals kill tussock moth larvae, but must be designed to meet the effects and efficacy requirements of the FIFRA. Specificially, data must be developed which can be used to assess the capability of a control mechanism to prevent tree defoliation and or tree mortality.

In addition the research program must include:

1. Further testing of Zectran to follow up on the 1973 tests. Particular attention should be paid to development and use during the test of the most effective methodology;

2. Further testing of resmethrin and bioethanomethrin with emphasis upon solving problems in application methodology;

3. Expanded testing of carbaryl and trichlorfon on larger test plots;

4. Conduct of statistical evaluations of the efficacy of DDT in preventing tree damage and mortality. In addition, experiments shall be conducted which test the efficacy of DDT at lower application rates. While it is the Agency's belief that with a conscientious effort to find an alternative to DDT, the use of this chemical will not be sought in the future, it would be foolish not to develop definitive data on the efficacy of this use;

5. Research designed to better define the correlation between the intensity of egg mass and larval populations, virus incidence, and tree damage and/or mortality. This research effort should have particular emphasis on improving ability to predict infestation intensity and resultant tree damage from early indicators.

The Agency is willing to work with the Forest Service and others in the development of the final research plan, particularly in giving guidance on experimental design as it relates to registration requirements.

C. Monitoring Requirements:

The Forest Service and affected State agencies must adhere to the general requirements of the monitoring plan which has been submitted to EPA. In addition to the program put forth in that plan, the Forest Service shall conduct pre- and post-spray sampling of forest litter and vegetation.

D. Labelling;

In accordance with Section 166.11 of the regulations (38 F.R. 33307) adopted pursuant to Section 18 of the FIFRA as amended, Montrose Chemical is hereby authorized to ship not to exceed 500,000 pounds of DDT for use by the U.S. Forest Service as provided by this Order, under a label to be specified by this Agency.

E. Other Considerations:

EPA reminds the Forest Service of the requirements of the Wild and Scenic Rivers Act (82 Stat. 906), the Bald and Golden Eagle Protection Act (16 USC 668), and the Endangered Species Act of 1973 (87 Stat. 884). While the granting of this exemption under Section 18 of FIFRA is not incompatible with these statutes, the geographic area involved in the proposed spray program contains features significant in terms of each of these laws and their requirements must be met.

FEB 28 1974

Russell E. Train
Administrator

Tussock Moth Will Face Battle by DDT

BY STEPHEN GREEN

DDT, the highly toxic pesticide banned in 1972, will be available for conditional use this spring on Northwest forests and on an Eastern Washington food corp, it was announced here yesterday by Russell Train, chief of the U.S. Environmental Protection Agency.

At a news conference, Train said the decision to allow use of DDT to combat a threatened tussock moth epidemic in 650,000 acres of Douglas fir forests was forced by "almost totally inadequate" research by the U.S. Forest Service — "to the point of dereliction."

The food crop involved in the ruling is some 105,000 acres of dry peas (used in pea soup) threatened by the pea-leaf weavil. The crops are to be planted in the Palouse farming region of Washington and Idaho, where the EPA also allowed the use of DDT in 1973.

Both decisions may end up in court, local conservationists said yesterday after Train's announcement.

Train said that before a final decision to spray timber lands is made the Forest Service must conduct thorough laboratory and field examinations of tussock moth egg masses and virus counts to determine whether conditions have produced "an actual emergency."

If an emergency is found to exist, then the Forest Service must prove that DDT is the only control agent that "will prevent unacceptable damage." Train declared.

"DDT should be permitted only as a stop-gap measure when practical alternatives are not available." Train said. "I remain personally convinced that the use of DDT represents a significant risk to ecological systems and that its use should be avoided wherever possible."

Train went on to accuse the Forest Service of "poor planning for forest pest management." The efforts on their part to date "to develop alternatives to DDT for control of tussock moth have been almost totally inadequate — to the point of dereliction" he said.

In Portland yesterday, the director of the Forest Service's experimental station, Dr. Robert Buckman, declared: "What I have to say in regard to Mr. Train's attack on the Forest Service is not printable."

Buckman said he agreed that his tussock moth research is lacking in funds. "We spent $370,000 on tussock moth research last year and we needed four to five times that amount."

"The irony," Buckman said, "is that we made more progress on this pest than any other major forest pest in the country. We did a lot with very little money. We are on the verge of finding alternatives to DDT. We will probably have the alternative for controlling tussock in 1976. DDT is a stop-gap until then."

Asked why the EPA did not conduct independent research on the tussock moth if it was dissatisfied with the Forest Service effort, Train replied, "It would not be practical for EPA to take on the job."

"They (the Forest Service) have the responsibility under law," Train said. "Our role (in the EPA) is to put heat on the management agencies" to obtain the desired results.

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